

PHYSICS 2023

TIME: 3 Hours

(85 Marks)

SECTION 'A' (Multiple Choice Questions)(17)

1. Select the correct answer for each from the given options:

(i) Kinetic energy per mole of an ideal gas is:

- * $\frac{3}{2}kT$ * $\frac{2}{3}kT$ * $\frac{3}{2}RT$ ✓ * $\frac{2}{3}RT$

(ii) An instrument which can measure and compare potentials without drawing any current from the circuit is called:

- * Ammeter * Voltmeter
* Potentiometer ✓ * AVOmeter

(iii) In laser, the lifetime of an electron in a metastable state is:

- * 10^{-3} sec ✓ * 10^{-8} sec * 10^3 sec * 10^8 sec

(iv) On equipotential surface, work done in moving charged particle is:

- * Positive * Negative * Zero ✓ * Infinite

(v) Balmer series of hydrogen atom spectrum lies in this region:

- * Infrared * Ultraviolet * Visible ✓ * Radio-wave

(vi) If the temperature of a cold body is decreased, the efficiency of Carnot engine will:

- * remain constant * increase ✓ * decrease * be zero

(vii) The device is used to make the path of ionizing particles visible:

- * Geiger Muller Counter * Cyclotron
* Wilson Cloud Chamber ✓ * Solid State Detector

(viii) The unit of potential gradient is:

- * volt/meter ✓ * Coulomb/meter
* Volt / Ampere * Volt/Ampere

(ix) If 1A current flows through 2m long wire, the charge flows through it in 2 hours will be:

- * 3600C ✓ * 7200C * 1C * 600 C

(x) To obtain p-type semiconductor silicon must be doped with the atom whose valency is:

- * 2 * 3 ✓ * 4 * 5

(xi) Reverse process of photoelectric effect is:

- * Pair production * Compton effect ✓
* Annihilation of matter * X-Ray production

(xii) Compton effect proves the:

- * Photon Theory of Light ✓ * Dual Nature of Light
* Nature of Light * Uncertain Nature of Light

(xiii) The energy radiated from black body is directly proportional to the fourth power of absolute temperature' This law is:

- * Wein's Law * Rayleigh Jeans Law
* Stefan's Law ✓ * Plank's Law

(xiv) A charge of 0.1C is accelerated through a potential difference of 1000 V, its kinetic energy will be:

- * 200J * 10J * 100J ✓ * 100 eV

(xv) It is the most suitable material for making core of electromagnet:

- * Air * Steel
* Copper and Nickel Alloy * Soft Iron ✓

(xvi) $\frac{\text{coulomb}}{\text{volt}}$ is equal to:

- * Newton * Joule * Farad ✓ * Ohm

(xvii) Rest mass of photon is:

- * Infinite * Zero ✓
* $9.11 \times 10^{-31} \text{kg}$ * $1.67 \times 10^{-27} \text{kg}$